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CALIFORNIA **URBAN WATER** AGENCIES

May 20, 1999

Mr. Lester Snow
Executive Director
CALFED
1416 Ninth Street, Suite 1155
Sacramento, CA

Subject: Proposed Source Water Quality Milestones for the CALFED Bay-Delta Program

Dear Mr. Snow:

CALFED has committed to continuous improvement in source water quality for Delta drinking water supplies so that water agencies will be able to meet current and future regulatory requirements and protect public health. Although CALFED set long-term targets at 3.0 mg/L for total organic carbon (TOC) and 50 ug/L for bromide, there was recognition in the Revised Phase II report that interim milestones are needed to measure continuous improvement in water quality during Stage 1 implementation. CALFED committed to "work with stakeholders prior to the Record of Decision to develop agreed upon measurable milestones to be used as indicators of continuous improvement in water quality during Stage 1." We believe a dual approach will be needed to measure the effectiveness of the Stage 1 water quality actions and to assess the impacts on water quality of other CALFED actions. One approach could consist of development of the milestones and comparison of water quality conditions at the export/diversion locations to the milestones. The second approach could consist of an evaluation of actions taken. For example, has a management plan for salinity in the Sacramento and San Joaquin basins been developed and implemented? Both approaches will be needed to measure the success of the CALFED program in improving drinking water quality in Stage 1. This will provide needed information for future decisions on the CALFED Program.

CUWA has developed recommended milestones for bromide and TOC for consideration by CALFED and the stakeholders participating in CALFED's Water Quality Technical Group. While we have focused on milestones for public health protection, it is also essential to develop water quality milestones for salinity to ensure continuous improvement in salinity levels and sufficient water quality to support local water management programs. CUWA is currently undertaking an effort to evaluate the cost implications and water resource management implications of source water salinity levels, and will develop proposed source water quality milestones for salinity for CALFED consideration.

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CUWA has considered possible milestones and recommends the adoption of the following source water quality milestones for bromide and TOC:

Proposed Source Water Quality Milestones for the CALFED Program

Safe Drinking Water Act Regulation	Promulgation/ Effective Date	Source Water Quality Milestones at the Effective Date *
Stage 1 D/DBP Rule IESWTR	December 1998/ December 2001	Bromide < 300 µg/L TOC < 4.0 mg/L (Values are quarterly averages.)
Stage 2 D/DBP Rule LT2ESWTR	May 2002/ 2005-2007	Bromide < 100-150 µg/L ** TOC < 3.5 mg/L ** (Values are quarterly averages.)
Stage 3 D/DBP Rule	December 2006/ 2009-2011	Bromide < 50 µg/L ** TOC < 3.0 mg/L ** (Values are monthly averages.)

* Assumes compliance with existing and proposed drinking water regulations using current best available technology, which is enhanced coagulation or ozone at pH 6.5.

** An equivalent level of public health protection may be achieved using a cost-effective combination of alternative source waters, source control and treatment.

We recommend that these proposed source water quality milestones apply in all source waters. If blending opportunities are not available, the milestones would apply at the drinking water intakes that deliver Delta water supplies to urban water agencies (e.g., H.O. Banks Pumping Plant, Tracy Pumping Plant, San Felipe intake on San Luis Reservoir, North Bay Aqueduct intake, and CCWD's Rock Slough and Los Vaqueros intakes). If higher quality sources are available to blend with Delta water, the milestones would apply at the location where supplies are blended. The milestones represent targets for source water quality improvement, assuming compliance with existing and proposed drinking water regulations using current best available technology, which is enhanced coagulation or ozone disinfection at pH 6.5. Alternatively, an equivalent level of public health protection may be met by utilizing a cost-effective combination of alternative source waters, source control and treatment technologies. Public health protection would be assessed by a comparison of treated water quality supplied to the consumer.

Urban water agencies using Delta water supplies may adopt difference approaches for meeting Safe Drinking Water Act requirements in the near term, including upgrading treatment facilities to include more advanced water treatment technology (e.g., ozone disinfection, enhanced coagulation), blending programs, water exchanges and storage. As a result, specific source water

needs for protecting public health in the near term may be different for different urban water agencies.

Basis of Recommended Milestones

The recommended source water quality milestones for bromide and TOC are based on technical evaluations contained in the Bay-Delta Water Quality Evaluation Draft Final Report prepared by CUWA's Expert Panel. Source water quality characteristics for Delta water supplies, which would allow water agencies implementing defined treatment technologies to comply with near term and long term regulatory scenarios were identified. The proposed milestones are supported by the need to protect public health and reduce health risks associated with exposure to disinfection by-products (DBPs). The milestones represent our best assessment of future drinking water regulatory requirements addressing DBPs and microbial pathogens. Because the milestones are also based on recently promulgated Safe Drinking Water Act requirements, they are defensible to other stakeholder groups. It is recognized that the drinking water regulations and treatment assumptions that these milestones are based on may change over time. Therefore, consistent with the CALFED adaptive management approach, it will be appropriate to reevaluate and adjust the milestones as the CALFED Program moves forward. The attached Table 1 provides more detail on the assumptions for the development of the milestone values and time frames.

The time periods for the bromide and TOC milestones are not fixed, but rather reflect the likely schedule of rule promulgation and effective dates for DBP rules over the next twelve years. This is important because urban water agencies must plan their strategies for compliance with future drinking water regulations and require significant lead-time to implement strategies for compliance, such as installation of advanced water treatment technology.

It should be noted that the proposed milestones for the time period 2005-2007 could change depending on requirements for *Cryptosporidium* inactivation and/or on the MCL for bromate in the Stage 2 D/DBP Rule. Higher MCLs for bromate (e.g., 10 µg/L) provide some relief for source water bromide concentrations, while *Cryptosporidium* inactivation requirements place emphasis on lowering allowable source water bromide levels. Further, potential regulation of individual DBP species (e.g., bromodichloromethane) will focus source water quality needs more closely on bromide, particularly in those cases where chlorination disinfection strategies are used. Another factor that may affect source water quality requirements for bromide and TOC is a possible future scenario in which distribution system averaging for compliance with the trihalomethane standard is eliminated.

It will be important to meet the milestones most of the time. Although individual treatment plants may be able to tolerate occasional excursions above the milestones and still comply with drinking water standards, the ability to do so will vary among the many treatment plants treating Delta water. The averaging periods for the 2001 and 2005-2007 water quality milestones are defined as maximum quarterly averages. It may be necessary to define the milestones as maximum monthly averages if the Stage 2 D/DBP and LT2ESWTR regulations are more stringent than currently anticipated. The water quality milestones for 2009-2011 are defined as maximum monthly averages to reflect the possible future decision to regulate DBPs based on both acute and

chronic impacts, if findings of future health effects studies warrant such a decision. In CALFED's December 18, 1998 Revised Phase II Report, the averaging period for the bromide and TOC water quality targets is not defined. This is an important issue that will also need to be resolved by CALFED working with CUWA and other stakeholders in the near future.

The source water quality milestones are targets to aim for, and progress toward achieving the milestones will help define needed adjustments in the CALFED Program. A critical issue associated with establishing source water quality milestones is how to determine whether or not milestones have been achieved. Due to natural variation in hydrology, changes in Delta operations and the impacts of other CALFED activities, it will not be possible in the short-term to measure definitively whether or not the milestones have been achieved in source water. As a result, evaluation of progress toward achieving milestones will need to include a combination of qualitative and quantitative evaluation. In the short-term, measurement of progress in achieving milestones should include an assessment of whether or not commitments for implementing water quality actions have been executed, and an evaluation of the effectiveness and water quality improvement resulting from implementation of specific actions. In the long-term, an overall assessment of changes in source water quality will need to be completed to evaluate progress toward meeting source water quality milestones and targets for the CALFED Program. This will require the implementation of a comprehensive monitoring and assessment program focused on drinking water parameters of concern.

Actions Required to Achieve Continuous Water Quality Improvement

To ensure protection of public health and continuous water quality improvement, CALFED needs to identify and commit to the implementation of a set of Stage 1 actions (e.g., source control, operating rules, water exchanges, and storage/conveyance improvements) that are linked to the achievement of the milestones, before releasing the Final Programmatic EIS/EIR. CUWA has developed a detailed matrix of Stage 1 actions that will be provided to CALFED after it has been reviewed by the CUWA Board of Representatives. While water agencies have essentially been meeting the 2001 milestones in normal and wet years, achievement of these near term milestones will require implementation of a strategy to reduce significant excursions in TOC and bromide levels, especially during dry years. This strategy is primarily based on operational modifications for water quality improvement. Based upon what we know now, implementation of source control actions and operational modifications will not be sufficient to achieve the milestones for the 2005-2007 and 2009-2011 time periods. Achievement of these intermediate and long term milestones will require a cost-effective combination of actions, including source control, water quality exchanges, new facilities and cost-effective treatment technologies.

Next Steps

CUWA is prepared to work with CALFED and other stakeholders to further develop the Water Quality Program. We believe that the following work must be completed promptly:

1) Evaluate the cost-effectiveness, feasibility and timing of water quality improvement actions, and develop a detailed matrix of actions to achieve continuous water quality improvement.

2) Define existing water quality conditions for the purpose of evaluating progress in meeting source water quality milestones, and work to ensure that CMARP includes sufficient monitoring and assessment actions to evaluate progress in source water quality improvement.

3) Define a process for determining how milestones can be achieved by providing an "equivalent level of public health protection".

4) Define the process for the Delta Drinking Water Council, including Council representation and responsibilities, and determine the role of the Council in evaluating progress in achieving continuous water quality improvement.

CUWA welcomes the opportunity to discuss our proposed milestones with CALFED and the other stakeholders participating in the CALFED process. Please call me if you have any questions on our proposal.

Sincerely,

Byron M. Buck
Executive Director

cc: Steve Ritchie, CALFED
Judy Heath, CALFED
Paul Marshall, CALFED